इंटरनेट मानक

Disclosure to Promote the Right To Information

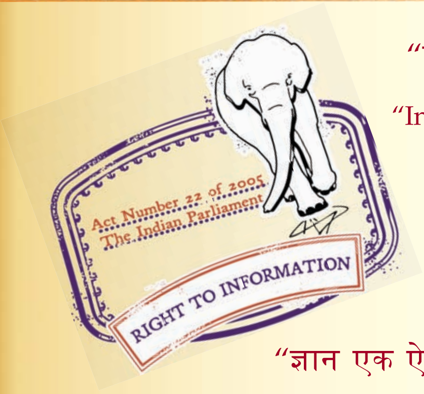
Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 7093 (1973): Straight through joint boxes and lead sleeves for paper insulated lead sheathed cables up to and including 11 kV [ETD 9: Power Cables]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"



Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

Indian Standard

SPECIFICATION FOR STRAIGHT THROUGH JOINT BOXES AND LEAD SLEEVES FOR PAPER INSULATED LEAD SHEATHED CABLES UP TO AND INCLUDING 11 kV

(Third Reprint MAY 1988)

UDC 621.315.687.22

© *Copyright* 1974

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARO
NEW DELHI 110002

Gr 3 ***May* 1974**

Indian Standard

SPECIFICATION FOR STRAIGHT THROUGH JOINT BOXES AND LEAD SLEEVES FOR PAPER INSULATED LEAD SHEATHED CABLES UP TO AND INCLUDING 11 kV

Conductors and Power Cables Sectional Committee, ETDC 32

Chairman	*Representing*
SHRI M. R. BHAT	Bombay Suburban Electric Supply Ltd, Bombay
Members	
SHRI N. D. CHAWLA (*Alternate* to Sfcri M. R. Bh;at)	
SHRI N. S. S. AROKIASWAMY	Tamil Nadu Electricity Board, Madras
SHBI P. S. THIRTJNAVUKKA-RASTT { *Alternate*)	
SHHI D. N. BAGCHI	Directorate General of Mines Safety (Ministry of Labour, Employment' & Rehabilitation), Dhanbad
SHRZ N. K. SEN (*Alternate)*	
WOCDBH. S. BHATIA	Directorate of Technical Development & Production (Air) (Ministry of Defence), New Delhi
SHBI H. C. PAKDE *{Alternate)*	
SHBI K. V. CHATJBAL	Federation of Electricity Undertakings of India,. Bombay
SHBI C. DASGUPTA	Calcutta Electric Supply Corporation Ltd, Calcutta
DBFUTY DIRECTOR (ELECTRICAL ENGINEERING)	Naval Headquarters
STAFF OFFICER (ELECTRICAL ENGINEERING) *(Alternate)*	
SHBI M. DEY	Indian Cable Co Ltd, Calcutta
SHRI N. V. RAMAN (*Alternate)*	
DIRECTOR *(* TRANSMISSION)	Central Water & Power Commission (Power Wing), New Delhi
DEPUTY DIRECTOR (TRANS» MISSION } (*Alternate)*	
SHRI M. L. DONGBE	Bombay Electric Supply & Transport Undertaking, Bombay
SHRI AVTAR SINGH { *Alternate)*	

(*Continued on page* 2)

@ *Copyright* 1974
BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

{ *Continued from page* 1)

Members	*Representing*
SHBI K. S. JOSHI	Oriental Power Gables Ltd, Kota
SHBI O. P. KWATRA (*Alternate*)	
SHBI V. A. KBISHNAMTJRTHY	Central Public Works Department, New Delhi
SURVEYOR OF WORKS II { ELECTRICAL) (*Alternate*)	
SHRJ M, R. LODH	Devidayal Cable Industries Ltd, Bombay
SHBI N. B. SHAH ,(*Alternate)*	
SHBI S. K. MANX	Ministry of Defence (DGI)
MAJOR D. S. DHANOTA (*Alternate*)	
SHBI D. R. MANOHAR	National Insulated Cable Co of India Ltd, Calcutta
SHBI J. S. BKAH (*Alternate)*	
SKBT M. N. MUKBRJEE	Railway Board {^Ministry of Railways)
SHBI C. A, SANKABANABA-YAMAN (*Alternate)*	
SHBI S, K. MUXHEBJEE	National Test Mouse, Calcutta
SHBI S. N. NAYAB	Aluminium Industries Ltd, Kundara
SHBI P. K. KRISHNA** NATR { *Alternate*)	
SHB-I J, S. PASSI	Directorate General of Supplies & Disposals (Inspection Wing), New Delhi
SHBI P. L. KAPXJR (*Alternate*)	
SHBI A. S, Pn**o	Delhi Electric Supply Undertaking, New Delhi
SHBI A. K. RAMAN	Asian Cables Corporation Ltd, Bombay
SHBI K. N. RAMASWAMY	Directorate General of Technical Development, New Delhi
SHBI D. P. GOTTA (*Alternate*)	
SHBI M. J. RAO	Tata Hydro-Electric Power Supply Co Ltd, Bombay
SHBI M, V. GONDHALEKAR (*Alternate)*	
SHBI L. K. SANQHI-	Fort Gloster Industries Ltd, Calcutta
SHBI A. S. BHATTACHABJBE (*Alternate*)	
DB P. S. SHAH	Cable Corporation of India Ltd, Bombay
SHBI S. R. PAPMAHABHAN (*Alternate*)	
SHBI 5. R. VKNXA3?ACHARI	Directorate General of Posts & Telegraphs, New Delhi '
SHBI G. C. NAOAR (*Alternate)*	
SHBI P. J. WADIA	Tata Consulting Engineers, Bombay
SHBI N. SBIWJVASAN, Deputy Director (Elcc Tech)	Director GeneraL BIS (Ex-officio *Memberr*)

Secretary

SHBI T. RA JABAMAN

Deputy Director (Elec tech), BIS

(Continued on page 10 *)*

3.4.3 The dimensions of the lead sleeves shall be as given in Table 1 read with Fig. 1.

TABLE 1 DIMENSION OF LEAD SLEEVES FOR STRAIGHT THROUGH JOINTS

Type Designation	Dimensions in mm, *Min*		
	Inner Dia	Inside Clear Length	Thickness
	Id	*l*	*t*
(1)	(2)	(3)	(4)
SL 0830	80	300	2·5
SL 0840	80	400	2·5
SL 1040	100	400	2·5
SL 1050	100	500	2·5
SL 1060	100	600	2·5
SL 1260	120	600	3·0
SL 1270	120	700	3·0
SL 1470	140	700	3·5
SL 1480	140	800	3·5
SL 1680	160	800	4·0

NOTE 1 — SL stands for lead sleeve for straight through joints.

NOTE 2 — The first two digits of the type designation denote inner diameter in col 2 and remaining digits denote the length in cm.

3.2 End Rings or Packing Strips — If required by the purchaser, suitable end rings or packing strips made of lead or lead alloy shall be provided.

3.3 Outer Cast Iron Protective Shell

3.3.1 The outer cast iron protective shell shall be cast from grey cast iron and shall have reasonably smooth finish and shall be free from blow holes. The casting shall conform to grade 20 of IS : 210-1970*.

3.3.2 The shell shall consist of two halves joined longitudinally, one forming the lower and the other forming the upper half. The two halves shall fit together in a tongue and groove provided on the edges of these two halves. The lower half of the shell shall be so designed as to remain practically horizontal when resting on the ground. The two halves of the cast iron outer shell shall be bolted together at slotted projections spaced evenly so as to ensure mechanically rigid and stable assembly. The outer of the shell shall be painted with suitable bitumen base.

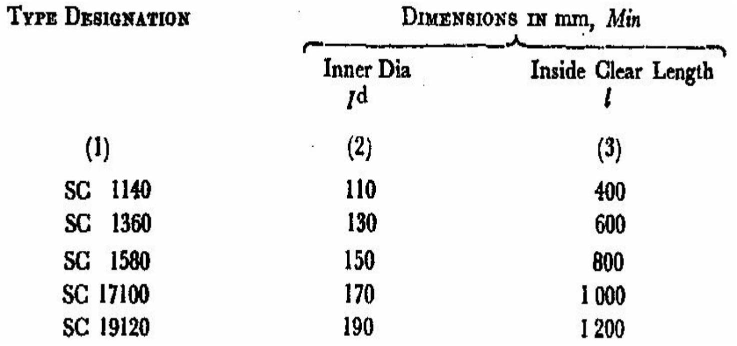
---

*Specification for grey iron castings (*second revision*).

3.3.3 If required by the purchaser, two armour clamps shall be provided, one on each side of the joint, bottom halves being integral with the lower half of the cast iron shell, while the top halves are bolted down. The bolt head shall be self-locking on the lower half of the shell.

3.3.4 The dimensions of the cast iron shell shall be as given in Table 2 read with Fig. 1.

TABLE 2 DIMENSIONS OF CAST IRON SHELL FOR STRAIGHT THROUGH JOINTS



Type Designation	Dimensions in mm, *Min*	
	Inner Dia d	Inside Clear Length *l*
(1)	(2)	(3)
SC 1140	110	400
SC 1360	130	600
SC 1580	150	800
SC 17100	170	1 000
SC 19120	190	1 200

NOTE 1 — SC denotes cast iron shell for straight through joints.

NOTE 2 — The first two digits of the type designation denote inner diameter in col 2 and remaining digits denote the length in cm.

3.3.5 Two symmetrical holes for filling the bitumen shall be provided on the top cover of the cast iron shell. Alternatively, one hole of length not less than 100 mm and width not less than 75 mm shall be provided in the centre. Suitable cover shall be provided on these holes.

4. MARKING

4.1 Lead Sleeve — The lead sleeves shall be marked with type designation punched clearly on its outer surface centrally between two pouring holes.

4.2 Cast Iron Shell — The upper half of the cast iron shell shall be marked with the following:

a) Manufacturer's name or trade-mark,
b) Type designation Number, and
c) The word 'ELECTRICITY'.

Indian Standard

SPECIFICATION FOR STRAIGHT THROUGH JOINT BOXES AND LEAD SLEEVES FOR PAPER INSULATED LEAD SHEATHED CABLES UP TO AND INCLUDING 11 kV

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 8 November 1973, after the draft finalized by the Conductors and Power Gables Sectional Committee had been approved by the Electro-technical Division Council.

0.2 This standard has been prepared to rationalize the types and sizes of straight through joint boxes and lead sleeves suitable for paper insulated lead sheathed cables for rated voltages up to and including 11 kV, conforming to IS : 6924973*.

03 The main object of this standard is to specify envelope dimensions of straight through joint boxes and lead sleeves to ensure sufficient inner space for maintaining adequate clearance after the cables are jointed.

0.4 The joint boxes included in this standard are of the horizontal and non-disconnecting type suitable for earthed or unearthed system.

0.5 It may be pointed out that the use of cast iron shell is optional; however, its use for cables of 3.3, 6.6 and 11 kV ratings is recommended.

0.6 The external dimensions of the cast iron boxes are not dealt with and the manufacturer is free to adopt any design, keeping in mind that they should provide enough mechanical strength to withstand the mechanical stress expected under installation condition as well as electro-dynamic stresses set up during fault conditions.

0.7 As far as practicable, various sizes of cables of different voltage grades are covered under single type of sleeve or box to limit the different sizes of boxes.

0.8 This standard also provides a guide for the selection of the joint boxes and the inner lead sleeves for various sizes of cables {*see* Appendix A).

---

*Specification for paper insulated lead-sheathed cables for electricity supply (*second revision*).

0.9 For the purpose of deciding whether a particular leqnirrmcnt of this standard is complied with, the final value, observed or calculated$_s$ expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOFE

1.1 This standard specifies die requirements of straight through joint boxes and lead sleeves, suitable far belted type cables for rated voltages up to and including 11 kV, conforming to IS: 692-1975†

1.2 This standard does not cover die actual jointing methods and various jointing materials required for jointing.

NOTE — The use of impregnated paper sleeves, separators and/or tapes is compulsory for 11 kV joints.

2. TERMINOLOGY

2.0 For the purpose of this standard the following definitions in addition to those given in IS: 1885 (Part XXXII)-197*1*+ shall apply.

2.1 Phase to Phase Grossed Joint—A joint where k is necessary to join cores of one cable to the corresponding cores of another physically twisting or crossing the cores.

2.2 Normal Joint — A joint where the cores of one cable arc jointed to physically-matching cores of another cable.

3- MATERIAL, DESIGN AMD CONSTRUCTION

3.1 Lead Sleeves

3.1.1 The sleeves shall be made of lead and shall be circular in shape and of uniform thickness. It shall not have any blow holes, pin holes or cuts.

3.1.2 The compound fifing holes shall be provided on die lead sleeve and shall be placed symmetrically at a distance not less than the diameter of the lead sleeve from its centre. The minimum diameter of the compound filling holes shall be 25 mm. Two lead caps of appropriate shape to close the holes after pouring die compound shall be provided.

NOTE — Alternatively, V-cut may be provided in lieu of eigher or *both* filling holes. In such a case, no cap is necessary

---

*Rules for rounding off numerical values (*revised).*

t Specification for paper insulted lead-sheathed cables for electricity supply (*second revision).*

♦Electrotecnnical vocabulary**:** Part XXXII Cables, conductors and accessories for electricity supply.

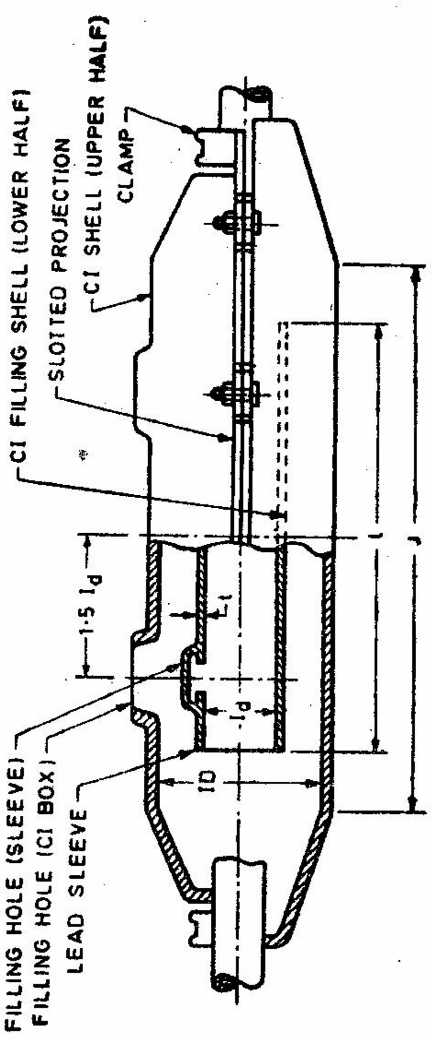


Fig. 1 Lead Sleeve and CI Shell for Jointing

43 The lead steeves and cast iron shell may also be marked with the Standard Mark

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

APPENDIX A

(*Clause* 0.8)

GUIDE FOR SELECTION OF LEAD SLEEVES AND CAST IRON SHELLS

A-1. SELECTION FOR WELDED NORMAL JOINTS AND SOLDERED CROSSED JOINTS

A-l.1 It is recommended that the selection of lead sleeves and CI shells may be made according to Table 3 for welded normal joints and soldered crossed joints.

NOTE — At present welded crossed joints arc not in practice.

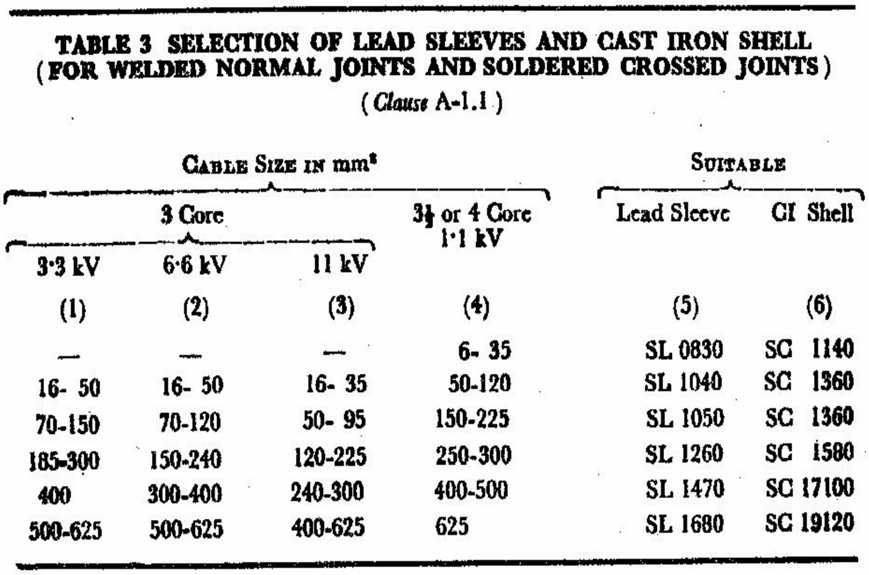


TABLE 3 SELECTION OF LEAD SLEEVES AND CAST IRON SHELL (FOR WELDED NORMAL JOINTS AND SOLDERED CROSSED JOINTS)

(*Clause* A-1.1)

CABLE SIZE IN mm²				SUITABLE	
3 Core			3½ or 4 Core 1·1 kV	Lead Sleeve	CI Shell
3·3 kV	6·6 kV	11 kV			
(1)	(2)	(3)	(4)	(5)	(6)
—	—	—	6- 35	SL 0830	SC 1140
16- 50	16- 50	16- 35	50-120	SL 1040	SC 1360
70-150	70-120	50- 95	150-225	SL 1050	SC 1360
185-300	150-240	120-225	250-300	SL 1260	SC 1580
400	300-400	240-300	400-500	SL 1470	SC 17100
500-625	500-625	400-625	625	SL 1680	SC 19120

A-2. SELECTION FOR SOLDERED NORMAL JOINTS

A-2.1 It is recommended that the selection of lead sleeves and Cast Iron shell for soldered normal joints may be made according to Table 4.

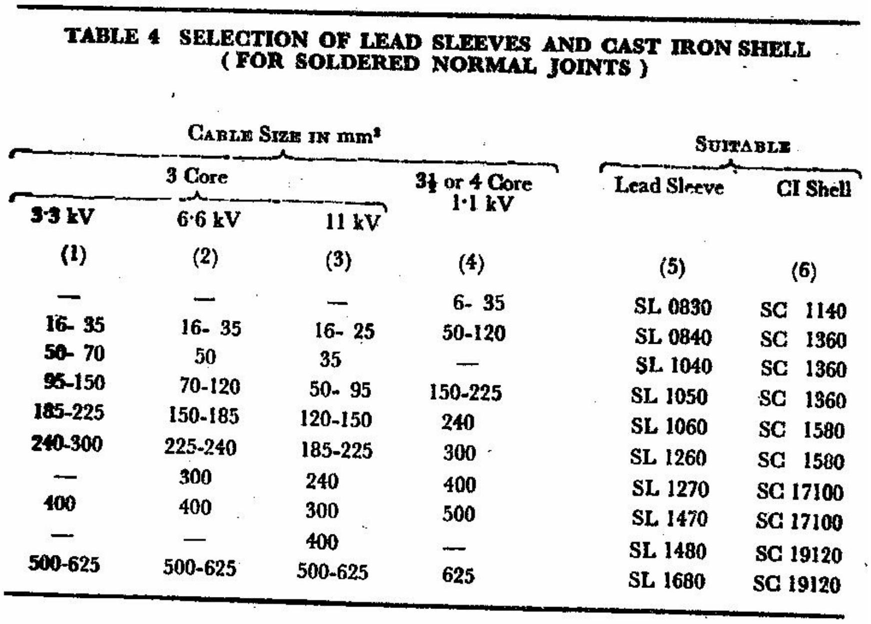


TABLE 4 SELECTION OF LEAD SLEEVES AND CAST IRON SHELL (FOR SOLDERED NORMAL JOINTS)

CABLE SIZE IN mm²				SUITABLE	
3 Core			3½ or 4 Core 1·1 kV	Lead Sleeve	CI Shell
3·3 kV	6·6 kV	11 kV			
(1)	(2)	(3)	(4)	(5)	(6)
—	—	—	6- 35	SL 0830	SC 1140
16- 35	16- 35	16- 25	50-120	SL 0840	SC 1360
50- 70	50	35	—	SL 1040	SC 1360
95-150	70-120	50- 95	150-225	SL 1050	SC 1360
185-225	150-185	120-150	240	SL 1060	SC 1580
240-300	225-240	185-225	300	SL 1260	SC 1580
—	300	240	400	SL 1270	SC 17100
400	400	300	500	SL 1470	SC 17100
—	—	400	—	SL 1480	SC 19120
500-625	500-625	500-625	625	SL 1680	SC 19120

(Continued from page 2)

Panel for Straight Through Joint Boxes, ETDG 32 : P 8

Convemr	*Representing*
SHM M. L. DOHGHIS	Bombay Electric Supply & Transport Undertaking, Bombay
Members	
SHM G. DASGUPTA	Calcutta Electric Supply Corporation Ltd, Calcutta
SHBX M. DKV	Indian Cable Co Ltd, Calcutta
SHHM. J. RAO	Tata Hydro-Electric Power Supply Co Ltd, Bombay
DB P. S. SHAH	Gable Corporation of India Ltd, Bombay

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
Telephones : 3 31 01 31, 3 31 13 75 Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :	*Telephone*
*Western : Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093	6 32 92 95
†Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054	36 24 99
Northern : SCO 445-446, Sector 35-C CHANDIGARH 160036	2 18 43 3 16 41
Southern : C. I. T. Campus, MADRAS 600113	41 24 42 41 25 19 41 29 16
Branch Offices :	
Pushpak,' Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	2 63 48 2 63 49
'F' Block, Unity Bldg, Narasimharaja Square, BANGALORE 560002	22 48 05
Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003	6 27 16
Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
53/5 Ward No. 29, R. G. Barua Road, 5th Byelane, GUWAHATI 781003	—
5-8-56C L. N. Gupta Marg, (Nampally Station Road), HYDERABAD 500001	22 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	6 34 71 6 98 32
117/418B Sarvodaya Nagar, KANPUR 208005	21 68 76 21 82 92
Patliputra Industrial Estate, PATNA 800013	6 23 05
Hantex Bldg (2nd Floor), Rly Station Road, TRIVANDRUM 695001	52 27
Inspection Office (With Sale Point):	
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

---

*Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007	89 65 28
†Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072	27 68 00

Reprography Unit, BIS, New Delhi, India